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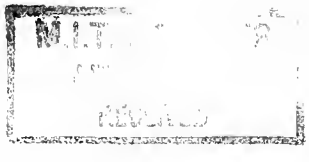

Cheap Talk with Two Audiences

by

Joseph Farrell and Robert Gibbons*
Berkeley and Hoover, and MIT

Revised, February 1989

Abstract. When an informed party can engage in cheap talk with more than one audience, we show how the presence of one audience may either discipline or subvert the speaker's relationship with the other audience. We ask how welfare is affected by public or private disclosure, and predict how much communication will take place.

Keywords. cheap talk, signaling, communication, incentives.

Cheap Talk with Two Audiences

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When an informed party can engage in cheap talk with more than one audience, we show how the presence of one audience may either discipline or subvert the speaker's relationship with the other audience. We ask how welfare is affected by public or private disclosure, and predict how much communication will take place.

Why are some claims made in public and others in private? Are public announcements always more credible than private ones? Should a politician meet with conservative and liberal constituents separately or together? How does it matter that a firm's claims about its profitability affect both its bond rating and its labor negotiations? When there are two candidates for a promotion, could the boss improve the credibility of his claims about their prospects by talking to both candidates together rather than separately? Why are engagements and weddings public? Why are letters of recommendation private?

These problems have in common a simple structure: an informed "sender" says something to two interested but uninformed "receivers," who then take actions based on their beliefs; these actions affect the sender as well as the receivers. In this paper we study how costless, nonverifiable claims (*cheap talk*) can affect these beliefs (and hence the actions), and how the incentives for truthful revelation to one receiver are affected by the presence of the other. We then ask how welfare is affected by whether claims are made in public or in private.

As some of the above examples suggest, public messages may be more credible than private messages addressed to either audience. One possibility is that the presence of one audience can discipline the sender's relationship with the other; we call this *one-sided discipline*. An analogous idea (although with costly signals rather than with cheap talk)

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has been discussed in the finance literature by Sudipto Bhattacharya and Jay Ritter (1983) and Robert Gertner, Gibbons and David Scharfstein (1988). But, as we show below, one-sided discipline is not the only interesting possibility, even in a very simple model. For instance, the presence of one audience may instead *subvert* the speaker's relationship with the other: credible communication may be impossible in public, though possible with one audience in private. Or, the informed party may be unable credibly to communicate with *either* audience in private, but able to communicate in public: we call this *mutual discipline.*

In Section I, we develop a simple model of cheap talk with two audiences. In Section II, we characterize the equilibria of our model, including those discussed above, and we give examples of some of the more interesting kinds of equilibria. In Section III, we consider the welfare implications of public or private disclosure. In Section IV, we analyze equilibrium selection, and predict how much information will be revealed. Finally, in Section V, we discuss (A) some further examples, (B) two extensions of our analysis, and (C) a possible direction for further work.

I . A Model

We develop the simplest possible model of cheap talk with two audiences. A *sender*, S, observes the state of the world $s \in \{s_1, s_2\}$; the (common-knowledge) prior probability of s_1 is π. There are two audiences or *receivers*, Q and R. (For pronominal clarity, we take S to be a man and Q and R to be women.) Each receiver can take an action: Q chooses q_1 or q_2, and R chooses r_1 or r_2. Each receiver's payoff depends on her own action and on the state of the world, s: for simplicity we suppose that it does not depend on the other's action.

If one audience had an action that was always optimal for her irrespective of her beliefs about s, then the sender would not have to consider her reactions. Consequently, there would be in effect only one audience, and this problem has already been well studied by Vincent Crawford and Joel Sobel (1982). Without loss of interesting generality, therefore, we suppose that the receivers' payoffs are such that if the state were known to be s_i then Q would choose q_i and R would choose r_i. By normalizing, we can display these payoffs as in Table 1, and then our assumption is that x_1, x_2, y_1 and y_2 are all positive.

		True State	
		s_1	s_2
Q's Action	q_1	x_1	0
	q_2	0	x_2

Table 1A: Q's Payoffs (Assume $x_1 > 0$, $x_2 > 0$)

		True State	
		s_1	s_2
R's Action	r_1	y_1	0
	r_2	0	y_2

Table 1B: R's Payoffs (Assume $y_1 > 0$, $y_2 > 0$)

Simplifying our problem further, we assume that the sender's payoff, u^S, is the sum of two components: one, u_Q^S, depending on Q's action, q, and the state, s; the other, u_R^S, on r and s. We write $u_Q^S(s_i, q_i) = v_i$ and $u_R^S(s_i, r_i) = w_i$ for $i = 1, 2$, and we normalize so that $u_Q^S(s_i, q_j) = u_R^S(s_i, r_j) = 0$ for $j \neq i$; see Table 2. Thus, for example, if $s = s_1$, Q chooses q_2, and R chooses r_1, then S's payoff is $0 + w_1$, Q's is 0, and R's is y_1.

		True State	
		s_1	s_2
Q's Action	q_1	v_1	0
	q_2	0	v_2

Table 2A: S's Payoff With Q

		True State	
		s_1	s_2
R's Action	r_1	w_1	0
	r_2	0	w_2

Table 2B: S's Payoff With R

If she has no information beyond her prior belief π, receiver Q will take her *pooling action*:

$$q^{\text{pool}} = \begin{cases} q_1, & \text{if } \pi x_1 \geq (1-\pi)x_2, \\ q_2, & \text{otherwise.} \end{cases}$$

Receiver R's pooling action r^{pool} is defined similarly.

Before the receivers choose their actions, the sender may make claims about the state s. These claims do not directly affect payoffs: they are "cheap talk." That is, they are not verifiable, not binding, and not (directly) costly.[1] Formally, S's claim is not an argument in any player's payoff function. Thus we need no notation for the claims themselves; only their information content matters. Since the meanings conveyed in pure-strategy equilibrium can only be "$s = s_1$", "$s = s_2$", and "no information," it is convenient to assume that no other messages are used in equilibrium. Any message-space with at least two messages would give the same set of pure-strategy equilibrium outcomes.

II . Equilibria With Two Receivers

We now describe the pure-strategy perfect Bayesian equilibria in our model. In order to do so, we must analyze three distinct cheap-talk games: the sender S speaking in private to Q, in private to R, and in public to both receivers at once.

In each of these games, and for all values of the payoff parameters (v_1, v_2, w_1, w_2), a *pooling* equilibrium exists. In such an equilibrium, the sender's talk is uninformative: for instance, whatever the true state, he says "no information."[2] Thus in a pooling equilibrium a receiver rationally ignores what the sender says: her posterior beliefs about s are identical to her prior beliefs,[3] and she takes her pooling action.

But there can also be other equilibria, in which talk does affect actions. Taking a single-audience case for definiteness, let $U(s_i, \text{"}s = s_j\text{"})$ be the sender's payoff when the

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[1] We abstract from considerations such as reputation that might induce S to tell the truth even when it is against his short-term interest. Similarly, we assume that it is impossible to promise side-payments contingent on any of the players' realized payoffs: for instance, because those payoffs are not publicly observed.

[2] Or, more generally, his message is uncorrelated with his private information s.

[3] To complete the formal description of equilibrium, we must specify what the receiver *would* believe if she heard an unexpected message. For simplicity, we can assume that she would maintain her prior beliefs.

true state is s_i and the receiver believes the sender's claim that the state is s_j (j may be equal or unequal to i).[4] Needless to say, such credulity may not be warranted. In a *separating equilibrium*, however, the sender's claim is credible.

Formally, a separating equilibrium is one in which S's claim fully reveals the true state: in the most natural separating equilibrium, S says "$s = s_1$" when the state is s_1, and says "$s = s_2$" when the state is s_2. Thus in a separating equilibrium, the receiver's rational posterior belief is either that $s = s_1$ for sure (so she takes her first action), or that $s = s_2$ for sure (so she takes her second action).[5] Given that S can induce either of these beliefs, the equilibrium condition is that he has no incentive to lie. Thus a separating equilibrium exists if and only if both

$$U(s_1, \text{“}s = s_1\text{”}) \geq U(s_1, \text{“}s = s_2\text{”}) \tag{1}$$

and

$$U(s_2, \text{“}s = s_2\text{”}) \geq U(s_2, \text{“}s = s_1\text{”}). \tag{2}$$

From conditions (1) and (2), there is a separating equilibrium when S speaks in private with Q if and only if $v_1, v_2 \geq 0$. Likewise, there is a separating equilibrium when he speaks in private with R if and only if $w_1, w_2 \geq 0$. Finally, in public, there is a separating equilibrium if and only if $v_1 + w_1 \geq 0$ and $v_2 + w_2 \geq 0$. This proves

Proposition 1. *While incentives for honesty in each relationship in private imply incentives for honesty in public, the reverse is not true.*

Our argument shows that the presence of one audience may discipline S's communication with the other (*one-sided discipline*), for instance if v_1 and v_2 are large and positive while w_1 and w_2 are small and negative. Such one-sided discipline (as well as the opposite case, *subversion*) can be illustrated in terms of the finance papers cited above, in which an

[4] For example, if the receiver is R then $U(s_1, \text{“}s = s_1\text{”}) = w_1$ and $U(s_1, \text{“}s = s_2\text{”}) = 0$. In the two-audience case, $U(s_i, \text{“}s = s_j\text{”})$ is the sender's payoff when the true state is i and both receivers believe that the state is j; thus, for instance, $U(s_1, \text{“}s = s_2\text{”}) = 0$ and $U(s_2, \text{“}s = s_2\text{”}) = v_2 + w_2$.

[5] As before, to complete the formal description of equilibrium, we must also specify what the receiver *would* believe if she heard an unexpected message. For simplicity, we assume that she would believe $s = s_1$.

informed firm signals to two uninformed audiences: a rival firm (contemplating entry) and the capital market. Suppose that credible cheap talk is impossible between the informed firm and its uninformed rival alone (the informed firm would always discourage entry), but is possible between the informed firm and the capital market. When communication is public, there can be either one-sided discipline or subversion. If the informed firm's relationship with the capital market is more important than its relationship with its uninformed rival, then the latter can learn something from the informed firm's public messages, because the presence of the capital market disciplines the communication. If, on the other hand, the informed firm is more concerned with potential entry than with its access to outside capital, then the lurking potential entrant subverts public communication with the capital market.[6]

Proposition 1 also suggests another possibility, even in our simple model. A separating equilibrium may exist in public because of *mutual discipline*. When v_1 and w_2 are large and positive while v_2 and w_1 are small and negative, no separating equilibrium exists with *either* audience alone, but the presence of each disciplines S's relationship with the other. Possible examples of mutual discipline include the firm dealing with bond-raters and a union, and a politician dealing with liberal and conservative constituents. In a single-audience problem in either of these examples, the sender's preferences over the receiver's actions (and thus over her beliefs) are independent of his true type, and so cheap talk cannot be informative. For example, the firm always wants the highest possible bond rating and the lowest possible wage demands, so no (cheap-talk) claim made to either audience alone is credible. But since these considerations tempt the firm to lie in opposite directions, its claims may be credible when it speaks to both audiences in public. Similarly, the politician who always wants votes cannot credibly claim to side with either audience in private, but may be able to do so in public, where his preferred image might no longer be independent of the truth.[7]

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[6] For other examples of subversion, consider, first, letters of recommendation. The writer of such a letter may be less honest if he knows that the subject of the letter will read it. Second, consider treaty negotiations or summit meetings between heads of state. If all negotiating statements were public, this might easily eliminate all real content from negotiation, leaving only vacuous posturing. That is, the incentives for dishonesty in playing to the public may subvert any incentives for honesty in dealing with other statesmen.

[7] The mechanism-design literature provides several other examples in which a privately informed agent

More systematically, we can distinguish five cases, as follows:

1. *No communication.* There is no separating equilibrium, in public or in private.
2. *Full communication.* There is a separating equilibrium with each receiver in private, and hence also (by Proposition 1) with both in public. There are no credibility problems.
3. *One-sided discipline.* There is a separating equilibrium in private with one receiver but not with the other, and there is a separating equilibrium in public.
4. *Mutual Discipline.* There is no separating equilibrium in private, but there is in public.
5. *Subversion.* There is a separating equilibrium with one receiver in private, but not with the other, and there is none in public. (Notice that, by Proposition 1, there cannot be *mutual subversion.*)

These cases are shown in the figures below, which plot w_1 against w_2. Moving around each figure corresponds to varying the nature and strength of S's relationship with R.

Figure 1 illustrates the case $v_1, v_2 > 0$, in which there is a separating equilibrium in private with Q. If S also has no incentives to lie to R (as in the upper-right part of Figure 1) then of course there can be honest communication in any forum, *i.e.*, in public or in private with either receiver. If there are strong incentives for S to lie to R, in either state or in both, then the presence of R subverts S's relationship with Q. And if there are only small incentives to lie to R, then honest public communication can be achieved as Q disciplines S's statements to R. This suggests viewing one-sided discipline as intermediate between subversion and full communication.

Figure 2 shows the case $v_1 < 0 < v_2$, in which S has an incentive to lie to Q in state 1 but not in state 2. If S has strong incentives to lie to R then there can be no credible communication in public or in private. If those incentives are weaker and are limited to state 2 then there is a possibility of mutual discipline. And if S would tell the truth to R

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faces temptations to lie in opposite directions. See for instance Peter Cramton and Thomas Palfrey (1986), Cramton, Gibbons and Paul Klemperer (1987), Tracy Lewis and David Sappington (1989), and Michael Riordan and Sappington (1987). These papers show that such "countervailing incentives" can mitigate the effect of the agent's private information, in much the same way that public communication improves credibility in the case we call mutual discipline.

in private, Q's presence will subvert that unless S's incentive to tell the truth to R in state 1 overcomes his incentive to lie to Q. Thus Figure 2 displays subversion and mutual discipline as intermediate cases between one-sided discipline and no communication.

Finally, Figure 3, for the case $v_1, v_2 < 0$ in which S always wants to lie to Q, shows subversion as intermediate between one-sided discipline and no communication: there is subversion if S has incentives to tell the truth to R but (in one or both states) those incentives are weaker than his incentives to lie to Q.

III . Welfare

In this section we discuss preferences over equilibria. More precisely, we ask whether agents prefer pooling or separating equilibria (should the latter exist) in a given forum. The results are of some interest in themselves, and may also help us understand why an agent, or an institution, might choose one forum over another.

When a separating equilibrium exists, receivers always prefer it to pooling, since they get more information and that can only help them.[8] The interesting questions therefore concern the sender's preferences. It turns out that these preferences are very simple in a single-audience version of our model, and also with two audiences when a "coherence" condition holds. More interesting effects arise when the coherence condition fails.

With one receiver, R, in our two-action model, the sender also certainly prefers separation to pooling, even *ex post*. For recall that, in a separating equilibrium, S can, by choosing a message, induce R to choose either of her two actions: hence, he can induce her to choose the action she would choose in the pooling equilibrium. Thus S has a larger choice set in separating than in pooling equilibrium, so he is (at least weakly) better-off.[9]

But this "expanded choice set" argument cannot generally be extended to the two-audience case, as we now illustrate. Suppose for example that a boss S is communicating

[8] If a receiver had to take into account others' responses to the fact that she has been informed, she might of course prefer to be kept ignorant, or — more precisely — to be thought to have been kept ignorant.

[9] This result does not extend beyond our simple two-action model. For example, in a three-action, two-state model, R may choose r_1 (r_2) when she thinks the state is s_1 (s_2), but choose r_3 in pooling equilibrium. If S would always like her to choose r_3 then he will prefer pooling to separation, even *ex-post*. In that case, however, a refusal by S to reveal the state would be a "credible neologism," which arguably would destroy the credibility of the separating equilibrium. See Farrell (forthcoming) or the discussion in Section IV below.

with two candidates for a promotion. Let the state of the world s_i be "candidate i will get the promotion (if she stays with the firm)." Each candidate must choose now either to stay on in the hope of the promotion, or to leave and take a new job (which she would prefer if and only if she will not get the promotion). In any separating equilibrium the candidate with poor prospects leaves, but if (say) $\pi \approx \frac{1}{2}$ and if each candidate prefers her chance of promotion to leaving, then both would stay in a pooling equilibrium. If the boss prefers that both stay then he prefers pooling to a public separating equilibrium, even if the latter exists.[10]

The key difference between this example and the single-receiver case is that here the sender can "get the best of both worlds" by revealing nothing. If π were *not* near $\frac{1}{2}$, then one of the candidates would leave unless credibly assured that she was in line for promotion, while the other would stay unless given reason for pessimism. And if that were so then, just as with one audience, the boss could always induce the pooling-equilibrium actions by using one of the two statements used in the separating equilibrium: the expanded-choice argument would apply and we could conclude again that he cannot prefer pooling if a separating equilibrium exists. But if each candidate cares more about staying if she will be promoted than about leaving if not, then the boss can "have it both ways" by pooling: that is, by remaining inscrutable.

Formally, if the prior beliefs π would induce one audience to select her first action, as if she believed s_1, and the other to select her second, as if she believed s_2, we call the game "incoherent:" it is easy to check that incoherence results whenever π lies between $\frac{x_2}{x_1 + x_2}$ and $\frac{y_2}{y_1 + y_2}$. Otherwise — that is, if the receivers would both choose their first actions, or both choose their second actions, based on the prior belief π — the game is "coherent."[11] In the promotion example, Q is the "first" audience, and her actions are q_1:"stay" and q_2:"leave." R is the second audience, and her actions are r_1:"leave" and r_2:"stay." If each

[10] Similar considerations arise if a government is known to be planning to put a highway through one of two neighborhoods. The residents' actions might be "continue to invest in the area" and "stop investing," and the government might prefer that residents of both neighborhoods continue to invest, as they might if the government remains inscrutable.

[11] It is worth remarking that there is no irrationality attached to incoherence: it is just that the receivers care differently about the types of errors they might make.

is concerned primarily not to leave when she would in fact be promoted, then $x_1 > x_2$ and $y_2 > y_1$, so the game is incoherent if π is close to $\frac{1}{2}$.

As our discussion of the promotion example suggests, the sender's preferences across equilibria in the coherent case are like those in the one-audience case.

Proposition 2. *If the game is coherent, the sender prefers separating to pooling, ex post and therefore also ex ante.*

Proof. In a public separating equilibrium, S can choose between inducing the action-pairs (q_1, r_1) and (q_2, r_2). By the definition of coherence, pooling induces one or other of those action-pairs. So S has a larger choice set in the separating equilibrium than in pooling. ∎

Thus, the coherent case is not so very different from the single-receiver case. But the incoherent case is much more complex, as we now discuss.

Without loss of generality, suppose that the receivers' pooling actions are (q_1, r_2). Then the s_1 type of S prefers pooling to separating if and only if $v_1 > v_1 + w_1$, and the s_2 type prefers pooling if and only if $w_2 > v_2 + w_2$. Thus S prefers pooling *ex-post* if and only if $0 > w_1$ and $0 > v_2$, and prefers pooling *ex ante* if and only if $\pi w_1 + (1 - \pi)v_2 < 0$. Recalling the conditions (1) and (2) for separating equilibrium, we have:

Proposition 3. *If the game is incoherent, the sender may prefer pooling to separating. (i) If a public separating equilibrium exists as a result of mutual discipline, he may prefer pooling ex post (and so also ex ante). (ii) If there is "full communication," he prefers separating to pooling ex post and ex ante. (iii) If a public separating equilibrium exists as a result of one-sided discipline, then he may prefer either separating or pooling ex ante, but cannot prefer pooling ex post.*

IV . Equilibrium Selection

In this section we show that, in the coherent case, if a separating equilibrium exists in our two-action model then the pooling equilibrium generically fails to satisfy a natural refinement criterion: it is not "neologism-proof" (Farrell, forthcoming). This suggests

that information about the state not only could but *will* be conveyed whenever a separating equilibrium exists. In the incoherent case, as we shall see, matters are again more complicated.

A. The Coherent Case

We consider for simplicity the one-receiver case: the coherent two-receiver (public communication) case is entirely similar. Without loss of generality, suppose that R's action in the pooling equilibrium is r_1, as it is in separating equilibrium when S persuades her that the state is s_1. Recall that for separating equilibrium to exist, we must have

$$U(s_2, \text{“}s = s_2\text{”}) \geq U(s_2, \text{“}s = s_1\text{”}). \tag{2}$$

If (2) holds strictly, as it generically will if it holds at all, then in the pooling equilibrium, in state s_2, S has an incentive to persuade R that s_2 is indeed the state. He cannot do so by using the message(s) used in pooling equilibrium, which will be interpreted as meaningless. But he could deviate by saying something unexpected[12] like:

> "Although you were not expecting me to reveal the state, please listen. The state is actually state s_2. I really mean this. Notice that, by (2), I have a strict incentive to persuade you of this if it is in fact true, and that, by (1), I have no such incentive if it is in fact false. Therefore you should believe me."

To sustain the pooling equilibrium, R must interpret this speech as providing little or no evidence about the true state. Intuitively, this is implausible, since R cannot dispute S's reminder about his incentives. Because such a speech can be made, we say that the pooling equilibrium is *not neologism-proof.* Moreover, no such objection can be made to the separating equilibrium: because both of the receiver's available actions are used in equilibrium, neither type of Sender can *strictly* prefer the pooling outcome to what he would get in separating equilibrium. Thus we have:

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[12] If in the pooling equilibrium S always says "no information" (as we assumed above), or says nothing, or even uses meaninglessly simple statements such as "$s = s_1$" and "$s = s_2$", then the following speech is an unexpected message, or "neologism."

Proposition 4. *In the coherent case with two actions, if there exists a separating equilibrium then, generically, the pooling equilibrium is not neologism-proof (and the separating equilibrium is).*

If the communication technology is very tightly controlled, S may have no chance to make such a speech. But observe that the players unanimously prefer the separating equilibrium to the pooling equilibrium, *ex post* (and hence also *ex ante*). Thus they have no incentive to try to prevent such speeches. We take this to imply that, in a forum in which a separating equilibrium exists, that equilibrium will be played.

Let us now step for a moment beyond our model — in which the forum has been exogenously given — and informally consider the selection of a forum. In the coherent case, all players prefer a forum in which a separating equilibrium exists (and, by Proposition 4, will be played), whether the choice is made *ex post* or *ex ante*. It therefore seems likely that such a forum will be used, if one exists, and that communication will then occur. For instance, in the mutual discipline case, we expect public separation, while in the subversion case we expect that S will privately reveal the state to one audience and (inevitably) pool with the other.

B. The Incoherent Case

As the promotion example shows, Proposition 4 does not extend to the incoherent case. (Specifically, the boss gets a better payoff by pooling than by either separating message, so he has no incentive to disrupt the pooling equilibrium — quite the reverse.) Moreover, not only may pooling be neologism-proof in an incoherent game, but S may prefer it to a separating equilibrium, especially in the mutual-discipline case (recall Proposition 3). Hence, equilibrium selection, whether by neologism-proofness or by players' preferences across equilibria, may not rule out the pooling equilibrium even in a forum in which a separating equilibrium exists.[13]

Moreover, we can no longer informally argue, as in the coherent case, that any "reasonable" mechanism to choose a forum will select a forum (if one exists) in which there

[13] By Proposition 4, however, we do expect separation in the "full communication" case.

is a separating equilibrium. There is no longer unanimity. If, for instance, the sender chooses the forum (whether *ex post* or *ex ante*), he may choose to remain inscrutable. Although there is a pooling equilibrium in every forum, choosing a forum in which there is no separating equilibrium may help S to wear the mask, so that for instance in the mutual discipline case we might expect to see S refusing to speak in public, although he might be willing to make (necessarily meaningless!) statements in private.

V . Discussion

In this section we discuss: (A) three further examples, (B) two natural extensions of our model, and (C) a possible direction for further work.

A. Further Examples

First, Jeremy Stein (1989) has recently adapted Crawford and Sobel's one-audience model to analyze cheap talk by the Federal Reserve Board (about future monetary policy). He shows that in equilibrium the Fed's claims can be credible but that they cannot be completely precise.[14] Our work suggests that further results should follow from multi-audience models:[15] the credibility of public claims should depend on the aggregate audience, but private talk could be either more or less credible than these public claims, much as in our model mutual discipline and subversion are both possible.

Second, David Austen-Smith (1988a,b) has modeled legislative debate as (public) cheap talk about the likely effects of a bill. He asked how such talk affects agenda-setting and voting. Our model suggests that it would be desirable to extend this work to include private "back-room" or "closed-door" communication, which might sometimes be more credible. Also in political science, Jeffrey Banks (1987) has asked what assumptions are necessary to make candidates' non-binding electoral "promises" credible: these promises can be modeled as cheap talk to many audiences — the voters.

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[14] In Stein's model, as in Crawford and Sobel's, the state of the world is drawn from an interval on the real line, and the most that can be credibly communicated is that the state lies in one of a certain collection of sub-intervals that partition the state space.

[15] In Stein's model, the single audience consists of speculators on the foreign-exchange market. Additional audiences might include employers, labor unions, and investors. Also, one could develop analogous models of the government's claims about future fiscal policy.

Third, an interesting two-audience communication problem arises in a firm's choice among accounting conventions. To a considerable extent, different (legitimate) conventions allow a firm to report higher or lower accounting profits.[16] For example, a firm that carries inventory for substantial periods of time in an inflationary era will report lower profits if it uses the LIFO (last in, first out) convention to determine the historic cost of units it is currently selling than if it uses the opposite FIFO (first in, first out) convention. Under LIFO, the firm calculates profits as if it is now selling units made at the relatively high (in nominal terms) recent cost, while under FIFO it calculates profits as if selling units made long ago at uninflated prices. Consequently, its tax liability is likely to be higher under FIFO. Many economists were puzzled at firms' reluctance to switch to LIFO in the inflationary era of the 1970s. A two-audience view of the problem is that the stock market as well as the Internal Revenue Service bases its actions on reported profits, and that firms like the stock market to think that their profits are high. This is, however, not a case of *cheap talk* to two audiences, since the firm's tax bill depends directly its reported profits (its message), and not just on the IRS's posterior beliefs.

B. Extensions

Our two-state, two-action model is the simplest non-trivial model of cheap talk to two audiences. In some settings, however, even with only two states, a minimal model requires more than two actions, because a receiver's pooling action may differ from both of her two separating actions. In this case, the existence and characterization results in Section II are unchanged, but even with just three actions the welfare and equilibrium-selection analysis in Sections III and IV becomes much more complex, and resembles the *incoherent* two-action case.

It is informative also to consider a model with more than two states of the world. Suppose there are three. Then, in addition to separating and pooling equilibria, there may be partial-pooling equilibria in which the Sender's claims reveal one of the three states but pool the other two together. Suppose there exists a separating equilibrium in private

[16] The Federal Accounting Standards Board (FASB), and the accounting profession in general, try to limit such latitude, but a considerable amount remains.

with Q, only a pooling equilibrium in private with R, and a partial-pooling equilibrium in public. Thus, the distinction between one-sided discipline and subversion is sharply drawn only in the two-state model; more generally, they are limiting cases of a single phenomenon.

C. Further Work

One natural question that we have not addressed is the following: if the sender chooses the forum *ex-post*, what can be inferred from his choice? For instance, what should you infer if someone tells you something in private that he could have told you in public? Such a choice might tell a listener something about the sender's information even before he actually speaks. In our two-state model, however, a separating equilibrium at the forum-choice stage would leave nothing to be said in the chosen forum. A richer and more complex model is needed in order to address this question.

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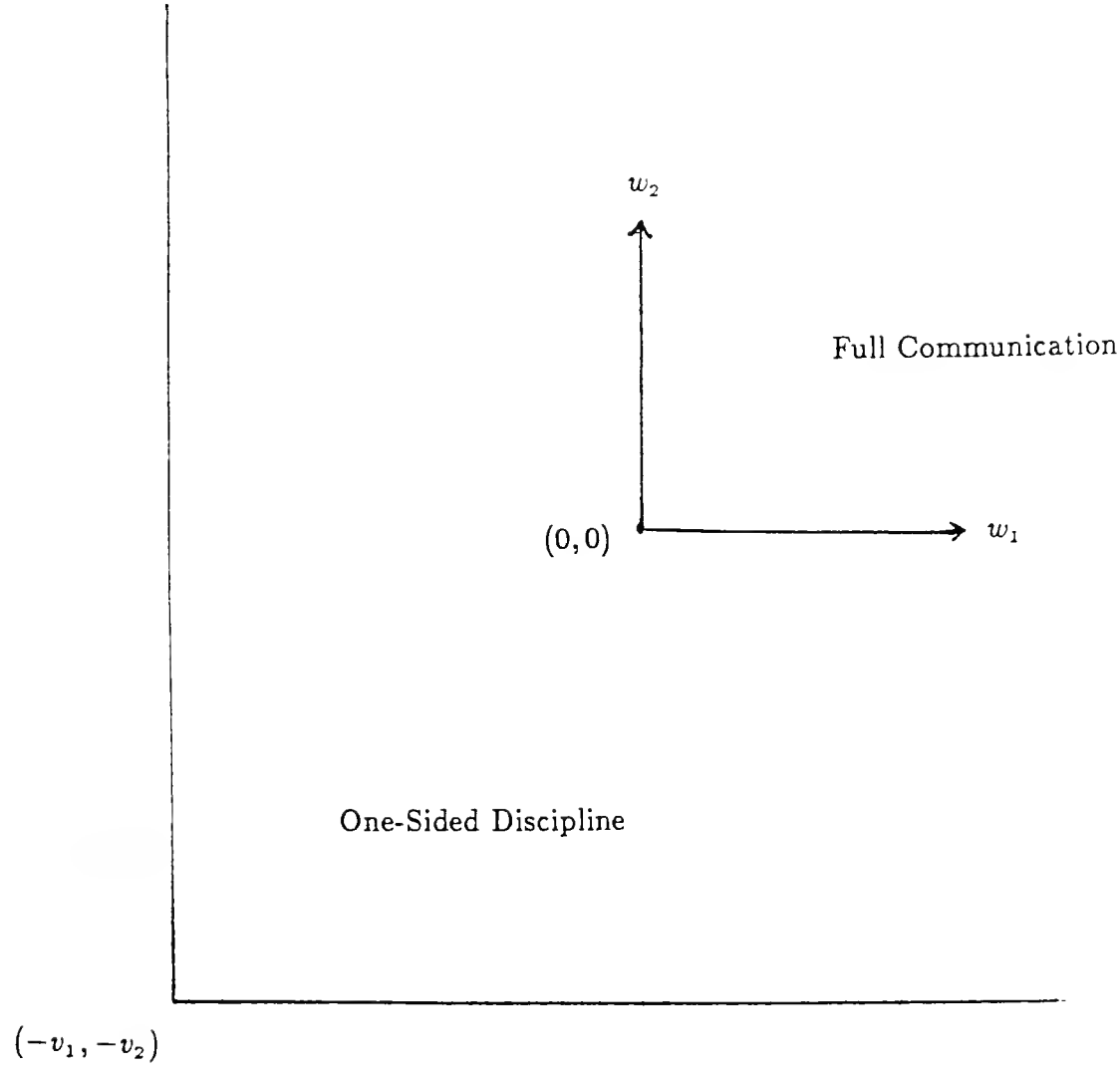


Subversion

Figure 1: The Case $v_1 > 0$, $v_2 > 0$

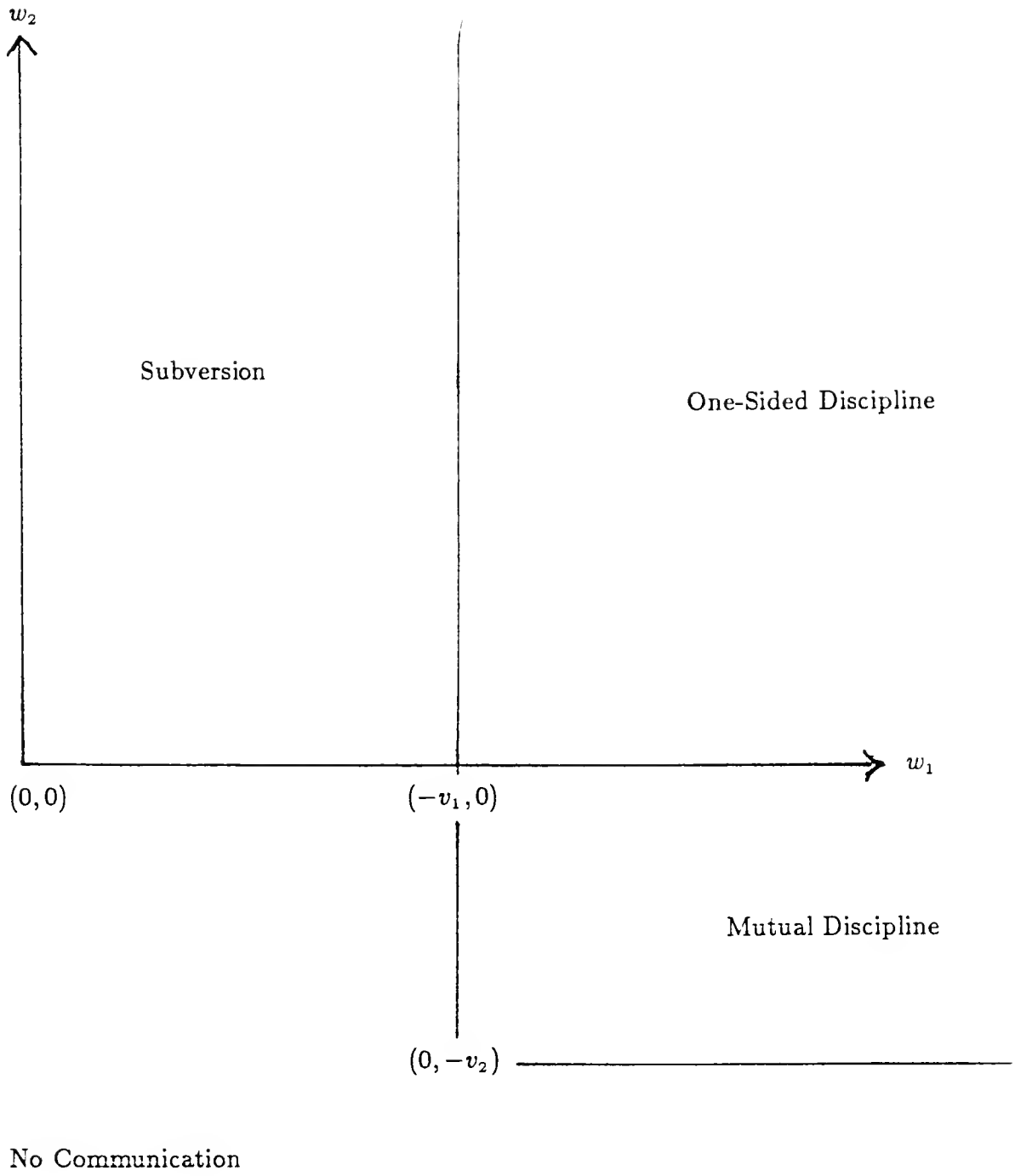
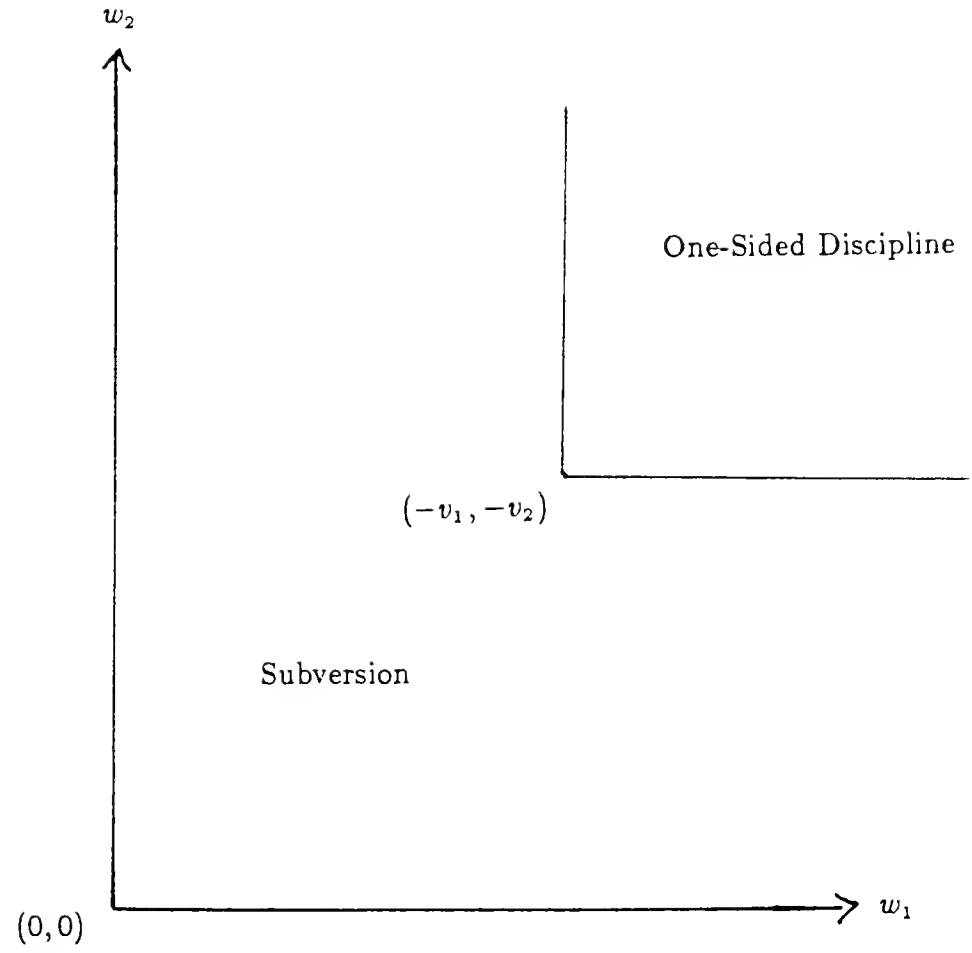


Figure 2: The Case $v_1 < 0, v_2 > 0$



No Communication

Figure 3: The Case $v_1 < 0, v_2 < 0$